

# MUR2020R

## SWITCHMODE Ultrafast Power Rectifier

### Features and Benefits

- Reverse Polarity Rectifier
- Low Forward Voltage
- Low Power Loss/High Efficiency
- High Surge Capacity
- 175°C Operating Junction Temperature
- These are Pb-Free Devices\*

### Applications

- Power Supply – Output Rectification
- Power Management
- Instrumentation

### Mechanical Characteristics

- Case: Epoxy, Molded
- Epoxy Meets UL 94, V-0 @ 0.125 in
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperatures for Soldering Purposes: 260°C Max. for 10 Seconds
- ESD Rating: Human Body Model 3B  
Machine Model C

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

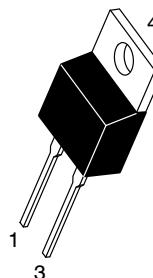
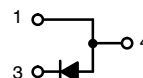


ON Semiconductor®

<http://onsemi.com>

**ULTRAFAST RECTIFIER  
20 AMPERES, 200 VOLTS**

**$t_{rr} = 95 \text{ ns}$**



**TO-220AC  
CASE 221B  
STYLE 2**

### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package  
AK = Diode Polarity

### ORDERING INFORMATION

| Device    | Package               | Shipping        |
|-----------|-----------------------|-----------------|
| MUR2020RG | TO-220AC<br>(Pb-Free) | 50 Units / Rail |

# MUR2020R

## MAXIMUM RATINGS

| Rating                                                                                                     | Symbol                          | Value       | Unit             |
|------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                     | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 200         | V                |
| Average Rectified Forward Voltage,<br>(Rated $V_R$ ), $T_C = 125^\circ\text{C}$                            | $I_{F(AV)}$                     | 20          | A                |
| Peak Repetitive Forward Current<br>(Rated $V_R$ ), $T_C = 125^\circ\text{C}$                               | $I_{FRM}$                       | 40          | A                |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 250         | A                |
| Operating Junction Temperature and Storage Temperature Range                                               | $T_J, T_{stg}$                  | -65 to +175 | $^\circ\text{C}$ |

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

## THERMAL CHARACTERISTICS

| Characteristic                                  | Conditions | Symbol          | Max | Unit               |
|-------------------------------------------------|------------|-----------------|-----|--------------------|
| Maximum Thermal Resistance, Junction-to-Case    | Min. Pad   | $R_{\theta JC}$ | 2.0 | $^\circ\text{C/W}$ |
| Maximum Thermal Resistance, Junction-to-Ambient | Min. Pad   | $R_{\theta JA}$ | 70  |                    |

## ELECTRICAL CHARACTERISTICS

| Characteristic                                                                                                                               | Symbol   | Min    | Typical      | Max        | Unit                |
|----------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|--------------|------------|---------------------|
| Instantaneous Forward Voltage (Note 1)<br>( $i_F = 20$ Amps, $T_J = 25^\circ\text{C}$ )<br>( $i_F = 20$ Amps, $T_J = 150^\circ\text{C}$ )    | $V_F$    | –<br>– | 0.97<br>0.79 | 1.1<br>1.0 | V                   |
| Instantaneous Reverse Current (Note 1)<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 150^\circ\text{C}$ )    | $i_R$    | –<br>– | 0.1<br>0.225 | 50<br>1.0  | $\mu\text{A}$<br>mA |
| Maximum Reverse Recovery Time<br>( $I_F = 1.0$ Amps, $di/dt = 50$ A/ $\mu\text{s}$ )<br>( $I_F = 1.0$ Amps, $di/dt = 100$ A/ $\mu\text{s}$ ) | $t_{rr}$ | –<br>– | –<br>–       | 95<br>75   | ns                  |

1. Pulse Test: Pulse Width = 5.0 ms, Duty Cycle  $\leq 10\%$ .

TYPICAL CHARACTERISTICS

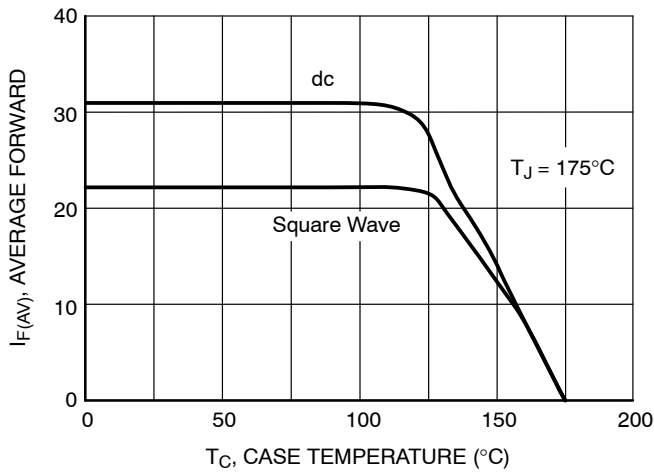


Figure 1. Current Derating

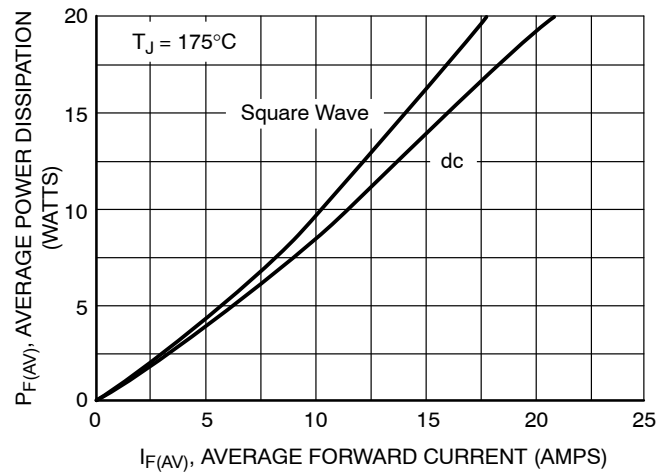


Figure 2. Power Dissipation

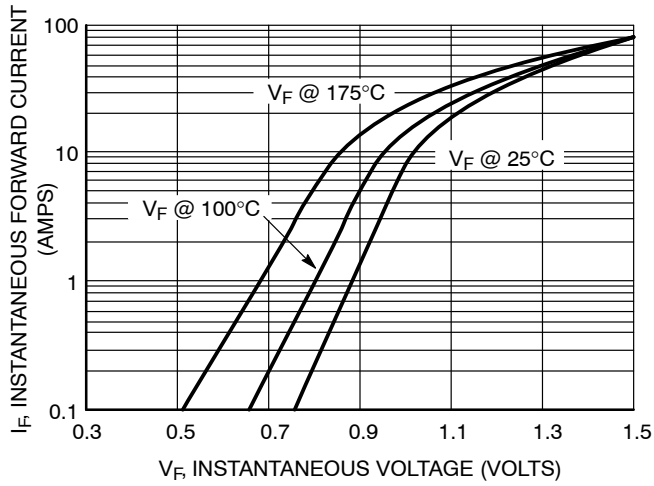


Figure 3. Maximum Forward Voltage

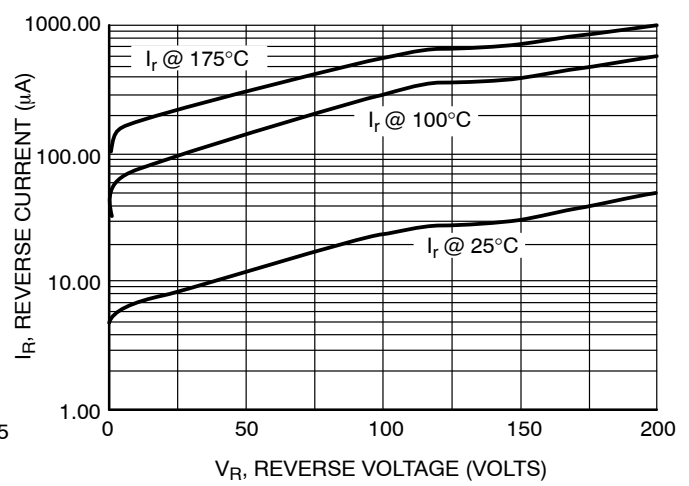


Figure 4. Maximum Reverse Current

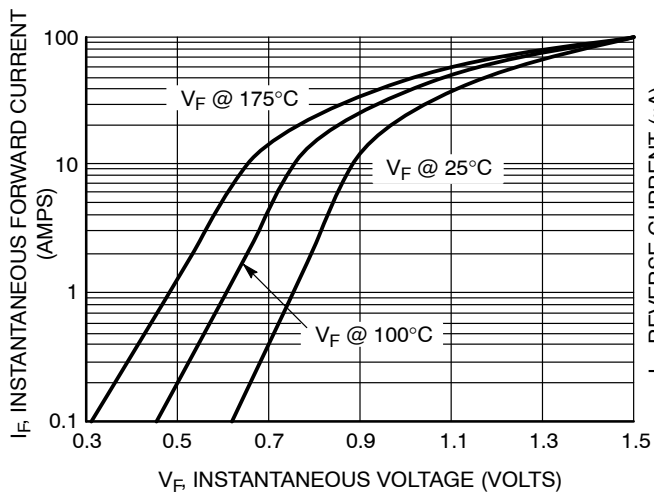


Figure 5. Typical Forward Voltage

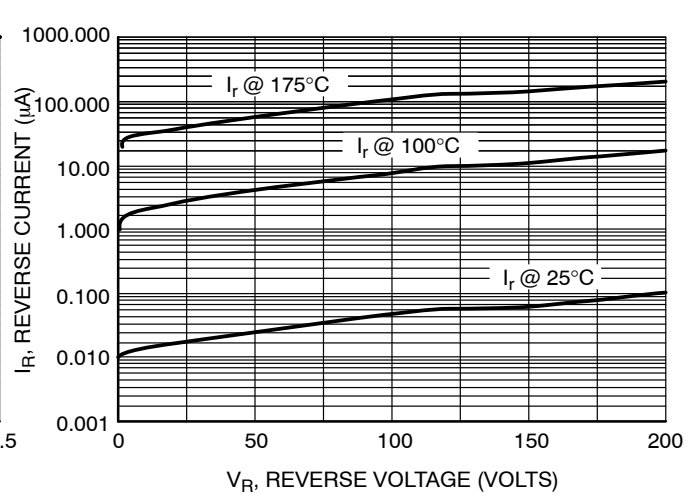


Figure 6. Typical Reverse Current

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## TYPICAL CHARACTERISTICS

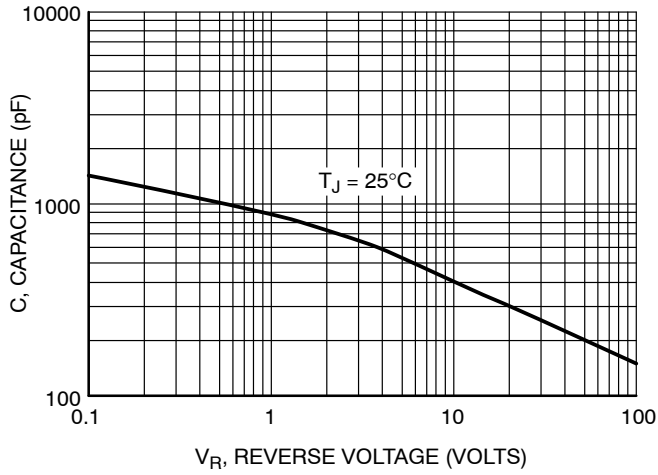


Figure 7. Maximum Capacitance

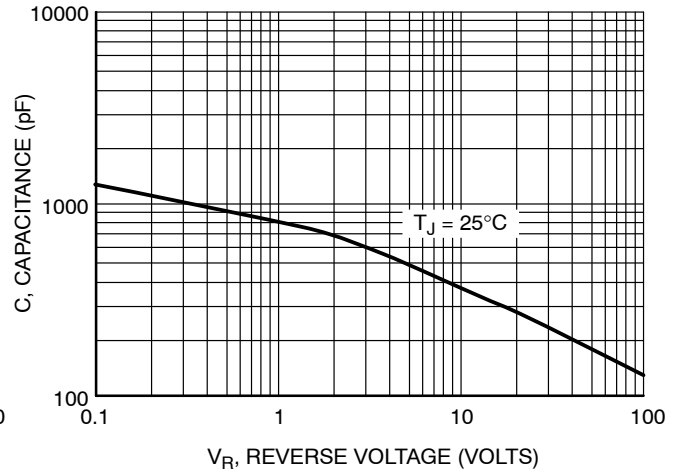


Figure 8. Typical Capacitance

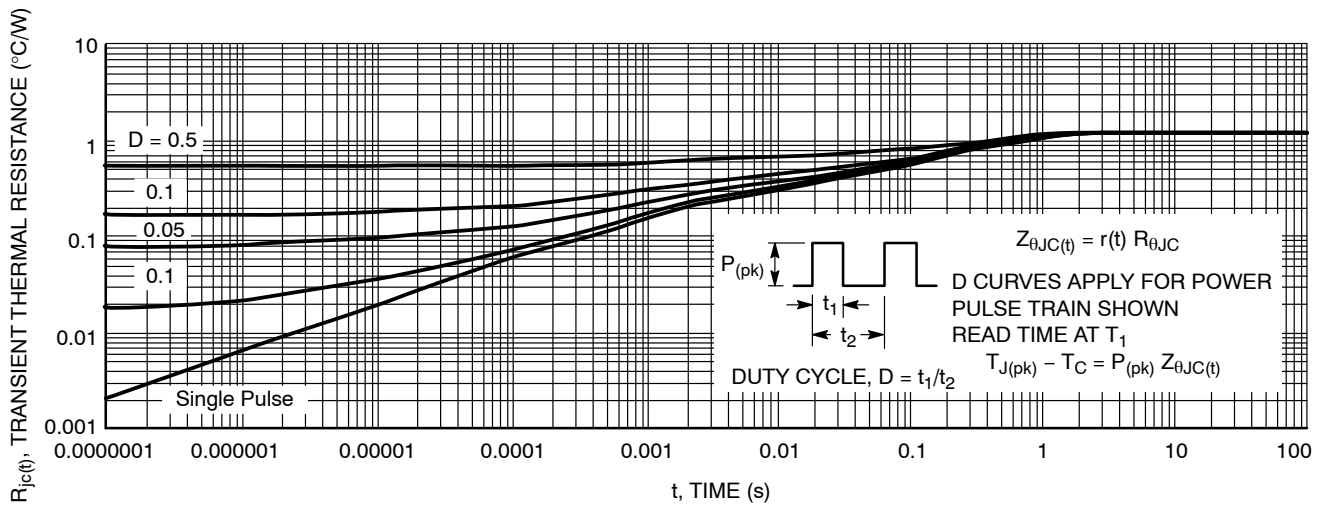


Figure 9. Thermal Response

# MECHANICAL CASE OUTLINE

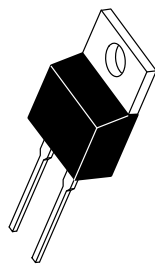
## PACKAGE DIMENSIONS

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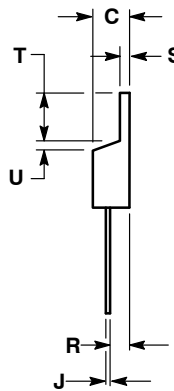
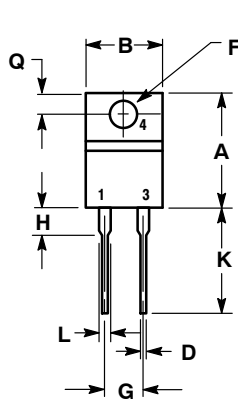


### TO-220, 2-LEAD CASE 221B-04 ISSUE F

DATE 12 APR 2013



SCALE 1:1



#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| DIM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 0.595  | 0.620 | 15.11       | 15.75 |
| B   | 0.380  | 0.405 | 9.65        | 10.29 |
| C   | 0.160  | 0.190 | 4.06        | 4.82  |
| D   | 0.025  | 0.039 | 0.64        | 1.00  |
| F   | 0.142  | 0.161 | 3.61        | 4.09  |
| G   | 0.190  | 0.210 | 4.83        | 5.33  |
| H   | 0.110  | 0.130 | 2.79        | 3.30  |
| J   | 0.014  | 0.025 | 0.36        | 0.64  |
| K   | 0.500  | 0.562 | 12.70       | 14.27 |
| L   | 0.045  | 0.060 | 1.14        | 1.52  |
| Q   | 0.100  | 0.120 | 2.54        | 3.04  |
| R   | 0.080  | 0.110 | 2.04        | 2.79  |
| S   | 0.045  | 0.055 | 1.14        | 1.39  |
| T   | 0.235  | 0.255 | 5.97        | 6.48  |
| U   | 0.000  | 0.050 | 0.000       | 1.27  |

STYLE 1:  
PIN 1. CATHODE  
2. N/A  
3. ANODE  
4. CATHODE

STYLE 2:  
PIN 1. ANODE  
2. N/A  
3. CATHODE  
4. ANODE

DOCUMENT NUMBER: 98ASB42149B

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DESCRIPTION: TO-220, 2-LEAD

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